

Appl. No. 09/715,629
Amendment dated.
Reply to OA of: January 6, 2005

Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

1 (original). A solid state imaging apparatus comprising:

means for receiving an incident light to thereby generate charges, the receiving means having one or more photoelectric conversion elements;

first accumulation means, in response to a first control signal, for accumulating the charges generated at each of the photoelectric conversion elements, the first accumulation means having one or more charge accumulation devices;

second accumulation means, in response to a second control signal, for accumulating the received charges generated from each of the photoelectric conversion elements, the second accumulation means having one or more charge accumulation devices;

first transfer means for transferring the charges accumulated in the first charge accumulation means in a serial sequence as a first charge signal;

second transfer means for transferring charges accumulated in the second charge accumulation means in a serial sequence as a second charge signal,

means for emitting light onto a target subject, wherein the intensity of the emitting light is controllable;

control means, based on a variation of the intensity of the emitted light, for outputting the first control signal or the second control signal to select the first or

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second charge accumulation means, thereby allowing the charges to be accumulated in the first or the second charge accumulation means, respectively; and

means for calculating a difference between the first charge signal and the second charge signal to thereby output a differential signal in sequence.

2 (original) The solid state imaging apparatus of claim 1, wherein each charge accumulation device in the first accumulation means and the second accumulation means is prepared for each corresponding photoelectric conversion element.

3 (original). The solid state imaging apparatus of claim 1, wherein said light emitting means is operated either in an on-state or in an off-state thereof; and said control means outputs the first control signal and the second control signal during the on-state and the off-state of said light emitting means, respectively.

4 (original). The solid state imaging apparatus of claim 1, wherein the charges accumulated in the first and the second accumulation means are fed en bloc to the first and the second transfer means, respectively; the first and the second transfer means transfer the charges in series; and at the same time, the first and the second accumulation means accumulate the charges.

5 (original). The solid state imaging apparatus of claim 3, wherein the first accumulation means additionally accumulates charges obtained during a continued on-state of the light emitting means and then transfers the obtained charges.

6 (previously presented). A solid state imaging device for use in a solid state

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imaging apparatus, the device comprising:

means for receiving an incident light to thereby generate charges, the receiving means having one or more photoelectric conversion elements;

first accumulation means, in response to a first control signal, for accumulating the charges generated from each of the photoelectric conversion elements, the first accumulation means having one or more charge accumulation devices;

second accumulation means, in response to a second control signal, for accumulating the received charges generated from each of the photoelectric conversion elements, the second accumulation means having one or more charge accumulation devices, wherein the second accumulation means is physically distinct from the first accumulation means;

first transfer means for transferring the charges accumulated in the first charge accumulation means in a serial sequence as a first charge signal;

second transfer means for transferring charges accumulated in the second charge accumulation means in a serial sequence as a second charge signal;

control means for outputting the first control signal or the second control signal to select the first or the second charge accumulation means, thereby allowing the charges to be accumulated in the first or the second charge accumulation means, respectively; and

means for calculating a difference between the first charge signal and the second charge signal to thereby output a differential signal in sequence.

7 (original). The solid state imaging apparatus of claim 6, wherein each charge accumulation device in the first accumulation means and the second accumulation means is prepared for each corresponding photoelectric conversion element.

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8 (previously presented). The solid state imaging device of claim 6, wherein said solid state imaging apparatus includes a light emitting means which is operated either in an on-state or in an off-state thereof; and said control means outputs the first control signal and the second control signal during the on-state and the off-state of said light emitting means, respectively.

9 (original). The solid state imaging device of claim 6, wherein the charges accumulated in the first and the second accumulation means are fed en bloc to the first and the second transfer means, respectively; the first and the second transfer means transfer the charges in series; and at the same time, the first and the second accumulation means accumulate the charges therein.

10 (currently amended). A solid state imaging device for use in a solid state imaging apparatus wherein said solid state imaging apparatus includes a light emitting means which is operated either in an on-state or in an off-state thereof, the device comprising:

means for receiving an incident light to thereby generate charges, the receiving means having one or more photoelectric conversion elements;

first accumulation means, in response to a first control signal, for accumulating the charges generated from each of the photoelectric conversion elements, the first accumulation means having one or more charge accumulation devices, wherein the first accumulation means additionally accumulates charges obtained during a continued on-state of the light emitting means and then transfers the obtained charges;

second accumulation means, in response to a second control signal, for

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accumulating the received charges generated from each of the photoelectric conversion elements, the second accumulation means having one or more charge accumulation devices;

first transfer means for transferring the charges accumulated in the first charge accumulation means in a serial sequence as a first charge signal;

second transfer means for transferring charges accumulated in the second charge accumulation means in a serial sequence as a second charge signal;

control means for outputting the first control signal or the second control signal to select the first or the second charge accumulation means, thereby allowing the charges to be accumulated in the first or the second charge accumulation means, respectively, wherein said control means outputs the first control signal and the second control signal during the on-state and the off-state of said light emitting means, respectively; and

means for calculating a difference between the first charge signal and the second charge signal to thereby output a differential signal in sequence.

11 (original). A solid state imaging apparatus comprising:

means having one or more photoelectric conversion elements for receiving an incident light and then generating charges;

first accumulation means having one or more charge accumulation devices, in response to a first control signal, for accumulating the charges generated at each of the photoelectric conversion elements and then transferring the accumulated charges in a serial sequence as a first charge signal;

second accumulation means having one or more charge accumulation devices, in response to a second control signal, for accumulating the received charges generated at each of the photoelectric conversion elements and then

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transferring the accumulated charges in a serial sequence as a first charge signal;

means for emitting light onto a target subject, the intensity of the light being controlled to be varied;

control means, based on a variation of intensity of the emitted light, for outputting the first control signal or the second control signal to select the first or the second charge accumulation means, thereby allowing the charges to be accumulated in the first or the second charge accumulation means, respectively; and

means for calculating a difference between the first charge signal and the second charge signal to thereby output a differential signal in sequence,

wherein in each of the first and the second accumulation means, the charge accumulation operation and the transfer operation are performed during different time periods from each other.